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EXAMINER	
ALLISON, ANDRAE S	
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/693,295	Applicant(s) SCHILLER ET AL.	
	Examiner Andrae S. Allison	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *October 24, 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *January 3, 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

a. The phrase "pixel of inertest" on page 6, lines 11-12 and line 13 should read "pixel of interest" because the word "interest" is misspelled.

b. The phrase "two input--" on page 16, line 16 should read "two input" because the dashes "- -" should be deleted.

c. The phrase "gating node-- to" on page 16, line 17 should read "gating s node to"" because the dashes "- -" should be deleted.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 17 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 17 recites the limitation "the neighborhood of pixels" in line 2. There is insufficient antecedent basis for this limitation in the claim. It is believed claim 17 was intended to depend on claim 2.

Claim 18 is being rejected as incorporating the deficiencies of claim 17 upon which it depends.

Appropriate correction is required.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 31 and 32 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claims 31 and 32 recites the limitation "machine readable medium" in line 1 of the above claims. Due to published Interim Guidelines "machine readable medium" is no longer considered as statutory. Therefore the limitation "machine readable medium" should be changed to "computer readable medium".

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-3, 5-7, 13-16, 20, 25, 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Luo et al (US Patent No.: 6,504,951) in view of Norton (US Patent No.: 5,912,994).

As to claim 1, Luo discloses a method for defining a boundary (differentiate true sky regions from other similarly color and textured subject matters; column 4, lines 33-34) separating a first region (e.g. non-sky-colored pixels, column 5, line 41) and a second region (e.g. sky colored pixels; column 5, line 41) of a digital image (200, Fig.2), the digital image including one or more color arrangements characteristic (see Fig 12 A, where the first region includes water and a boat which has various colors) of the first region and one or more color arrangements characteristic (sky color which includes non-uniform blue and almost white colors; column 6, lines 59-65) of the second region. Lou teaches determining using a learning machine (color classifier, column 8, line 47) based on one or more of the color arrangements, which pixels of the image satisfy criteria (if gradient value is above predetermined threshold, the region is considered a non-sky regions; column 6, lines 18-19) for classification as associated with the first region. Luo also teaches determining using a learning machine (color classifier, column 8, line 47), based on one or more of the color arrangements, which pixels of the image satisfy criteria (if belief value of candidate region is above a certain threshold, the regions is declared a sky column 6, lines 18-19) for classification as associated with the second region. Luo teaches identifying pixels of the image that are determined not to

satisfy the criteria for classification as being associated either with the first region or the second region (marginal pixels; column 10, line 53).

However, Luo does not teach identifying pixels and decontaminating the identified pixels to define a boundary between the first and second regions. Norton teaches a method of masking an object (column 1, line 59) including identifying pixels (a pixel is identified if it in a certain range, column 16, lines 45-50) and decontaminating the identified pixels to define a boundary between the first and second regions (column 17, lines 1-4). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added the method of masking an object to the method of defining a boundary of Luo for detecting a boundary of a substantially color-homogeneous region of a frame of a digitized picture stock (column 1, lines 61-65) with "increased efficiency" (column 1, line 54). Also, the process of Norton allows for better segmentation of the various regions of the image and better identification of ambiguous pixels.

As to claim 31, this claim differ from claim 1 only that the limitations a computer program product, tangibly stored on machine readable medium and the product comprising instructions operable to cause a processor are additively recited in the preamble. Lou clearly teaches a computer program product (column 3, line 6). Note the discussion above, Norton teaches machine-readable medium (memory, column 3, line 24) and the product comprising instructions operable to cause a processor (12, see Fig 1).

As to claim 32, Luo teaches a computer program product (column 3, line 6), tangibly stored on machine readable medium, for segmenting a first region (e.g. non-sky-colored pixels, column 5, line 41) and a second region (e.g. sky colored pixels; column 5, line 41), each region including one or more color arrangements (see Fig 12 a) that are characteristic of the region. However, Lou does not teach machine readable medium and the product comprising instructions operable to cause a processor to: receive an input that selects a portion of the first region and an input that selects a portion of the second region; identify pixels, based on the inputs and the color arrangements of the first and second regions, located in the first region; and identify pixels, based on the inputs and the color arrangements of the first and second regions, located in the second region.

Norton teaches a method of masking an object (column 1, line 59) including machine readable medium (memory, column 3, line 24) and the product comprising instructions operable to cause a processor (12, see Fig 1) to: receive an input that selects a portion of the first region and an input that selects a portion of the second region (202, see Fig 6); identify pixels (210, see Fig 6) based on the inputs and the color arrangements of the first and second regions, located in the first region; and identify (210, see Fig 6) pixels, based on the inputs and the color arrangements of the first and second regions, located in the second region. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added the method of masking an object to the method of defining a boundary of Luo for detecting

a boundary of a substantially color-homogeneous region of a frame of a digitized picture stock (column 1, lines 61-65) with "increased efficiency" (column 1, line 54). Also, the process of Norton allows for better segmentation of the various regions of the image and better identification of ambiguous pixels.

As to claim 2, Luo teach wherein a pixel being considered by the learning machine is associated with a corresponding neighborhood of pixels, the method further comprising: providing to the learning machine input information specifying a color arrangement of the corresponding neighborhood of pixels, wherein the learning machine is configured to classify the pixel being considered, based on the color arrangements of the corresponding neighborhood of pixels, as either associated with the first region or with the second region (see column 10, lines 53-60 where the marginal pixels mentioned above are relabeled base on the neighboring pixels).

As to claim 3, Lou teaches a method wherein a color arrangement represents a visual texture (e.g. the water in Fig 12 A).

As to claim 5, Luo teaches a method wherein the learning machine is a neural network (column 5, lines 4-5)

As to claim 6, Luo teaches a method wherein the learning machine is configured to provide an output classifying the pixel being considered, the output indicating a

probability of the pixel being associated with the first region and a probability of the pixel being associated with the second region (see column 8, lines 47-50, where a pixel classifier is trained to output a belief value between 0 and 1 a pixel, 1 indicating a highly likely to be blue sky and 0 indicating not very likely to be blue sky).

As to claim 7, Lou teaches a method wherein the output is a floating point (number between a lower number (e.g. 0; column 8, line 45) and an upper number (e.g. 1; column 8, line 45) the lower number indicating a one-hundred percent probability of the pixel being associated with the second region (e.g. 0 indicating the likelihood a pixel as non-sky; column 8, line 45) and the upper number indicating a one-hundred percent probability of the pixel being associated with the first region (e.g. 1 indicating the likelihood a pixel ideal blue sky; column 8, line 45).

As to claim 13, Luo teaches a method of training the learning machine to classify pixels (column 8, lines 20-21).

As to claim 14, Lou teaches a method wherein training includes selecting, based on user input, a training set of pixels used to train the neural network (column 8, lines 30-35).

As to claim 15, note the discussion above, Norton teaches the method wherein the training set of pixels selected includes pixels located within a particular range of the

boundary (see Fig 6, step 208, where a range can be adjusted).

As to claim 16, note the discussion above, Norton teaches a method wherein the particular range is 20 pixels from either side of the boundary. In the spec (page 19, [p][22], line 10), Applicant states that the particular range can in the range of 2 to 100 pixels. Consequently, there is no significant advantage or disclosed criticality in choosing the particular range to be 20 pixels, therefore it would have been obvious that the particular range can be 20 pixels.

As to claim 20, note the discussion above, Norton teaches constructing from the identified pixels a boundary mask that indicates which pixels of the digital image are the identified pixels (column 17, lines 16-21).

As to claim 25, note the discussion of claim 2 above.

7. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Luo et al (US Patent No.: 6,504,951) in view of Norton (US Patent No.: 5,912,994) further in view of Wang et al (Pub No.: US 2003/0007683).

As to claim 4, Lou in view of Norton does not teaches a method wherein the learning machine is a support vector machine. Wang teaches a method of separating text from drawings (page 1, [p][0005], lines 1-2) that includes using a support vector

machine as a learning machine (page 1, [p][0006], lines 4). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have substituted the color classifier of Luo with the support vector machine of Wang for classifying a stroke according to the slope curvature vector as either "text" or "unknown" (page 1, [p][0006], lines 8-10), because each reference ~~region~~ is for segmenting out one region from another and the use of a support vector machine is well known to segment regions of an image.

8. Claims 8-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Luo et al (US Patent No.: 6,504,951) in view of Norton (US Patent No.: 5,912,994) further in view of Littmann et al (NPL Document titled "Apative Color Segmentation – A comparison of Neural and Statistical Methods).

As to claim 8, Lou teaches wherein the lower number is -1 and the upper number is 1 (column 8, line 45). However Both Lou and Norton do not teach wherein the lower number is –1. Littmann teaches a method of comparing learning classifiers (page 175, [p][2], line 4-6) including wherein the lower number is –1 (page 176, [p][3], line 7). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added the method of comparing classifier of Littmann to the method of defining a boundary of Luo as modified by Norton for classifying pixels in an image as foreground (e.g. hand, page 175, [p][4], line 6) and background (page 175,

[p][4], line 6), and because this simply gives a commonly used value to represent one of the conditions.

As to claim 9, note the discussion above, Littmann teaches a method of converting the floating point number to an integer between a first integer and a second integer, the first integer indicating a one-hundred percent probability of the pixel being associated with the second region, and the second integer indicating a one-hundred percent probability of the pixel being associated with the first region (see page 179, [p][7], lines 7- 8, where the output the classifier are scale to gray values).

As to claim 10, note the discussion above, Littmann teaches a method wherein the first integer is 0 and the second integer is 256 (see page 179, [p][7, lines 8-9 where the above mentioned gray values are in the range of [0, 256]). Also, these are the standard values for gray value image data.

As to claim 11, Luo teaches the criteria for classification as associated with the first region includes having an integer that exceeds a first threshold; and the criteria for classification as associated with the second region includes having an integer that is less than a second threshold (see column 9, lines 25-32, where the value of each pixel is proportional to its belief value and a global threshold is used to create a binary map, 1 is considered a potential sky pixel and 0 is considered a non-sky pixel).

As to claim 12, Lou teaches the method of claim 11, wherein: the first threshold is 170 and the second threshold is 85. There is no real significant advantage for choosing the first threshold to be 170 and second threshold to be 85, therefore it obvious that the first and second threshold can be 170 and 85 respectively.

9. Claim 17-19, 24, 26-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Luo et al (US Patent No.: 6,504,951) in view of Norton (US Patent No.: 5,912,994) further in view of Boskovitz et al (NPL Document titled "An Adaptive Neuro-Fuzzy System for Automatic Image Segmentation and Edge Detection").

As to claim 17, the combination of Lou and Norton do not teach the method of claim, wherein: the neighborhood of pixels is one of a three-by-three square of pixels, a five-by-five square of pixels, and a seven-by-seven square of pixels.

Boskovitz teaches a method for multilevel image segmentation (page 247, [p][3], lines 1-2) that includes wherein: the neighborhood of pixels is one of a three-by-three (see Fig 6b) square of pixels and a five-by-five square of pixels (see Fig 6c).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added the method for multilevel image segmentation of Boskovitz to the method of defining a boundary of Luo as modified by Norton for segmentation of intensity image (page 261, [p][1], line 1) without "require any human expert intervention, nor any a priori information about the input image" (page 261, [p][1],

lines 20-23). Also, the use of 3x3 and 5x5 windows of pixels to process image data is extremely conventional and allows a large image to be processed in smaller, easier to process blocks.

As to claim 18, note the discussion above, Boskovitz teaches the method wherein the pixel being considered is located at a center of the neighborhood of pixels (see Fig 6a).

As to claim 19, note the discussion above, Boskovitz teaches the learning machine is a neural network (see Fig. 5); the neural network includes hidden nodes and gating nodes (see Fig. 5); and a gating node is associated with a corresponding hidden node, the gating node being configured to determine, based on a location of a pixel of being considered, a contribution the corresponding hidden node makes to an output of the neural network (page 263, [p][1]).

As to claim 24, note the discussion of claims 1 and 19 above.

As to claim 26, note the discussion of claims 17 and 18 above.

As to claim 27, Boskovitz teaches the method of training the gating node to determine, based on the location of the pixel of being considered, a contribution the hidden node makes to an output of the neural network (page 253, [p]4]).

As to claim 28, Boskovitz teaches the method of training the hidden nodes to classify pixels as either associated with the first region or associated with the second region, wherein the training of the hidden nodes occurs during the training of the gating nodes (page 253, [p]4]).

As to claim 29, Boskovitz teaches the method of wherein the neural network includes: input nodes (see input layer in Fig 5) configured to receive input information specifying the location of the pixel being considered and to provide the input information to the gating node.

As to claim 30, Boskovitz teaches the method wherein the neural network includes: input nodes (see input layer in Fig 5) configured to receive input information specifying the color arrangement of the corresponding neighborhood of pixels and to provide the input information to the corresponding hidden node.

10. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Luo et al (US Patent No.: 6,504,951) in view of Norton (US Patent No.: 5,912,994) further in view Simon et al (Pub. No.: US 2004/0170337).

As to claim 21, Both Luo and Norton do not teach a wherein decontaminating produces an opacity mask, the method further comprising: constructing from the

identified pixels a probability mask; and combining the opacity mask and the probability mask. Simon teaches a method for enhancing an appearance of a face located in a digital image (page 2, [p][12], lines 3-4). Simon also teaches wherein decontaminating produces an opacity mask (generate alpha channel mask; page 6, [p][59], line 16-17), the method further comprising: constructing from the identified pixels a probability mask (page 6-7 [p][61], line 8); and combining the opacity mask and the probability mask (page 8, [p][72], lines 11-12). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added the method for enhancing an appearance an image of Simon to the method of defining a boundary of Luo as modified by Norton to "enable the retouching of portrait without requiring skilled operator intervention to make and supervise the retouching correction" (page 2, [p][13], lines 3-5).

As to claim 22, note the discussion above, Simmon teaches the method of combining the opacity mask and the probability mask includes multiplying the opacity mask with the probability mask (see page 7, [p][64], lines 4-5, where combining probability maps includes arithmetic multiplication).

11. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Luo et al (US Patent No.: 6,504,951) in view of Norton (US Patent No.: 5,912,994) further in view Mao (Pub No.: 2003/0063797).

As to claim 23, Lou teaches the method wherein the first region is a foreground (e.g. nonsky pixels such as the water and the boat in Fig. 12 A) of the image and the second region is a background (e.g. sky in figure 12 A) of the image. Note the discussion above, Norton teaches decontaminating includes excluding from the identified pixels a pixel that has no foreground colors (adjust border range, column 16, line 41-43). However, Both Lou and Norton do not teach changing colors of a pixel that includes both foreground and background colors so that the changed identified pixels include only foreground colors. Mao teaches a selection tool for defining a border area (page 1, [p][0009] that includes teach changing colors of a pixel that includes both foreground and background colors so that the changed identified pixels include only foreground colors (change the color of a pixel in a target pixel map to foreground color) (page 4, [p][0048]).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to added the selection tool of Mao to the method of defining a boundary of Luo as modified by Norton to simplify "selection of complicated objects by providing a wide selection brush" (page 4, [p][0052], lines 2-4) and because each reference is for segmenting region of an image.

Conclusion

The prior art made part of the record and not relied upon is considered pertinent to applicant's disclosure.

Luo et al (US Patent No.: 7,062,085) is cited to teach a method for detecting subject matter regions in a digital color image.

Okamina (US Patent No.: 6,778,701) cited to a feature extraction device for calculating features in pattern recognition that includes using a neural network as a classifier.

Kim et al (Pub No.: US 2002/0102017) is cited to teach a method for sectioning an image in plurality of regions based on color and texture.

Inquires

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrae S. Allison whose telephone number is (571) 270-1052. The examiner can normally be reached on Monday-Friday, 8:00 am - 5:00 pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on (571) 272-7695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Andrae Allison

September 21, 2006

A.A.

JOSEPH MANCUSO
SUPERVISORY PATENT EXAMINER